Mesozoic and Cenozoic paleokarst events and related structures in the Western Carpathians

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In the West Carpathian zone called Pieniny Klippen Belt, the oldest paleokarst features are related to the Middle Jurassic rifting and rising of the so-called Czorsztyn Swell. This was accompanied by breakage (neptunian dykes), emersion and erosion of new lithified sediments and forming the toe-of-slope megabreccias. There is an interesting cave-dwelling fauna of ostracods Pokornyopsis feifeli Triebel, descendants of which still inhabit submarine caves in tropical seas. Further drowning of the Czorsztyn swell led to deposition of the Rosso Ammonitico facies, with local occurrences of stromatactis mud-mounds. Stromatactis structures were enigmatic for over a century but at one of the sites the participants will have a chance to see that stromatactis are just cavities after collapsed siliceous sponges.

Later, on the Szorsztyn Swell there was also an Early Cretaceous emersion which resulted in expressive paleokarst karren surface. The emersion period started in Hauterivian and ended in Albian with sudden flooding (ingression) with deposition of red pelagic marls. Therefore, until recognition of the paleokarst features, this break in sedimentation was considered to be caused by submarine non-deposition and erosion.

In the Central Western Carpathians, an older period of emersion was related to the Mid-Cretaceous crustal shortening and nappe stacking. The nappe stacking resulted in emersion and karstification of the highest nappe surfaces, forming paleokarst surface depressions filled with bauxites and breccias with fossil Terra Rosa and fresh-water cyanophyte limestones resting on the unconformity surfaces.

A younger, Neogene erosional and karstification phenomena in the Central Western Carpathians are best manifested along the former, Miocene eastern shoreline of the Vienna Basin. They are represented by Middle/Upper Badenian and earlier, Eggenburgian transgressive surfaces along the eastern shore of the Vienna Basin. Paleokarst phenomena, such as clefts and caves were initially filled with sinters, as well as by terrestrial sediments locally with rich fauna. The erosion and karstification phase was followed by the Middle/Late Badenian marine transgression.

Keywords: Western Carpathians, paleokarst, neptunian dykes, collapse breccias, stromatactis

Lokvarka Cave (Croatia) microclimate and dripwater settings: Implications for comprehensive speleothem paleoclimate records interpretation

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There are many systematic studies which emphasize the importance of understanding cave atmosphere and hydrology in order to select suitable stalagmites for paleoclimate analyses. In order to collect data which are important for reliable and confident interpretation of Lokvarka Cave speleothems palaeoclimate records cave monitoring program (surface and cave air temperature, relative humidity, dripping rates, precipitation and drip water stable isotope composition) was established through one-year period (November 2014–November 2015).

Lokvarka Cave is situated in the Lokvarka stream blind valley side, in Gorski Kotar area, the narrowest part of the Dinaric mountain range, at an altitude of 780 m a.s.l. It is a complex cave which consists of three main levels formed in lower Jurassic limestone. Depth of the cave is 277 m and length is 1200 m. Broader area of the Lokvarka Cave is characterised by Cfb climate, with high values of annual precipitation (>3000 mm) while MAAT recorded during 1981–2014 period is 8.3 °C.

Monitoring sites were situated at the depth of 40 m and 50 m in respect to entrance elevation. Estimated thickness of limestone overlay is about 80–90 m. On both sites, data loggers for measurements of cave air temperature, relative humidity and drip rates were installed. External air temperature and relative humidity were measured for the purposes of comparison with cave air properties and composite monthly meteoric water samples were collected in the house yards 2.5 km from the cave, while daily precipitation data are provided by CHMS for the meteorological station Delnice (6 km from LOK).